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ABSTRACT

In the course of developing a program evaluation scheme, a study was done of program topics identified as important to problem-based learning (PBL) by faculty and students at the John A. Burns School of Medicine (JABSOM) at the University of Hawaii (Manoa) where a PBL curriculum is used. The study interviewed and surveyed key stakeholders, asking about the program topics an evaluation should address and priorities among the suggested topics. Data were collected from 8 basic science and 8 clinical faculty involved in the planning and administration of the curriculum and 10 students. In addition, about 40 first-year students and 25 second-year students participated in separate group interviews. The results were content analyzed and summarized into 43 program topics in 9 categories. A second survey was done to collect responses on how the topics should be prioritized. This process revealed some differences between faculty and students in ranking of topics and eventually resulted in the following ranking for the top half of the scale (51-100): (1) tenets of the program; (2) understanding and practice of PBL; (3) knowledge and skills; (4) competent, caring, ethical, and well-adjusted physicians; (5) psychosocial and population knowledge; (6) congruence and consistency of curricular methods; (7) affective environment; (8) student assessment; and (9) teaching environment. Included are 1 table, an appendix containing results, and 16 references. (JB)

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Program Topics Identified by Faculty and Students as Important for Program Evaluation in a Problem-Based Medical School Curriculum

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Program Topics Identified by Faculty and Students as Important for Program Evaluation in a Problem-Based Medical School Curriculum

Introduction

Over the years, traditional medical education has faced some difficult problems, among them (a) a body of knowledge that students cannot cover in four years of medical school, (b) the rapid obsolescence of parts of this knowledge, (c) too great a focus on teaching and too little on learning, and (d) a lack of attention to social and psychological issues and their effects on health care. To help address these problems, the John A. Burns School of Medicine (JABSOM) at the University of Hawai'i at Mānoa has joined the growing list of medical schools that have implemented problem-based learning (PBL) curricula (Barrows & Tamblyn, 1980; Boud & Feletti, 1991). JABSOM was one of the first medical schools in the world to fully adopt PBL over all four years without an alternative traditional curriculum track. The JABSOM PBL curriculum is designed to (a) reduce information overload by helping students define what they need to know, (b) emphasize self-directed learning, (c) organize medical concepts and facts within the context of clinical problems rather than by disciplines, (d) emphasize humanistic and behavioral understanding and skills, and (e) provide students with extensive experience in community-based medical education. Unlike their predecessors in JABSOM's traditional curriculum, students in the PBL program have gathered in small groups of five or six where, guided by faculty tutors, they have actively directed their own learning.

In the second year of the PBL program, JABSOM contracted Curriculum Research and Development Group (CRDG) of the University of Hawai'i at Mānoa to design and conduct an evaluation of the PBL curriculum. When developing the evaluation design, CRDG interviewed and surveyed key PBL stakeholders, including clinical faculty, basic science faculty, and students, and asked about (a) the program topics the evaluation should address and (b) priorities among these topics. The results of the interviews and survey, including information about the content of the program topics and between-group differences in topic priority, have implications not only for evaluation but also for program development. In this paper, the methods of the study are described and the implications of the study's results for program evaluation and program development are presented.

Background

It has long been recommended that *program-evaluation stakeholders*[1] be involved in the design and implementation of program evaluation studies. In recent years, such involvement has become increasingly frequent. Involving

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[1]Shadish, Cook, & Leviton (1991) have defined program-evaluation stakeholders as "those whose lives are affected by the program and its evaluation" (p. 179).

stakeholders in the design of evaluations improves the studies' validity (Brandon & Newton, 1992; Owlston, 1986) and the potential for the utilization of evaluation findings (Greene 1988a, 1988b; Weiss, 1983; Mark & Shotland, 1985). However, with the exception of the evaluation reported by Kerbeshian (1986), medical schools have not sought input from faculty and students in the design of curriculum evaluations. Consequently, they have obtained little information from stakeholder groups who are affected by the curriculum and who have considerable first-hand knowledge about it. Some issues that may be important to curriculum participants, such as concerns about the implementation of the program, may not have been adequately addressed by these evaluations. With few exceptions (e.g., Cleeve-Hogg & Byrne, 1988; Gijselaers & Schmidt, 1990), evaluations of innovative medical school curricula have examined only student outcomes (see, for example, Schmidt, Dauphinee, & Patel, 1987), an approach recommended by some leading PBL evaluators (Friedman et al., 1990).

Data collected from stakeholders during the design of evaluation studies may provide information that can be used in ongoing program development. Stakeholders' input can inform curriculum planners about the extent of participants' understanding of the curriculum, the parts of the curriculum they think important, and the concerns they have about its implementation and outcomes. Curriculum planners and administrators can use this information to (a) examine congruence between the goals of the curriculum and the goals of its participants, (b) identify problems in the implementation of the curriculum, (c) identify features or components of the curriculum that require greater elaboration or emphasis, and (d) plan future educational activities, such as tutor training workshops and student orientations. Stakeholder participation in the design of evaluation studies should provide greater clarity, strengthen the understanding and increase the involvement of all who are associated with the curriculum, and enhance the commitment to curriculum goals and methods.

Methods for Identifying and Prioritizing Program Topics

Identifying the Topics

For this study we defined stakeholders as JABSOM's clinical faculty, basic science faculty, and students. Our first task was to identify program topics. In open-ended interviews, faculty and students were asked (among other things) about the program topics they would like the evaluation to address. Individual interviews were conducted with (a) eight basic-science and eight clinical faculty involved in the planning and administration of the PBL curriculum and (d) 10 students. About 40 first-year students and 25 second-year students (the first two cohorts in this curriculum) participated in separate group interviews. Our rationale for involving students was to enhance the validity of the findings—that is, to obtain information about the curriculum that might be unknown to the faculty or program planners.

Following the conclusion of the interviews, the results were content analyzed and summarized into 43 program topics. These topics, shown in Appendix A, fall into nine categories: (a) tenets of PBL (three topics); (b) understanding and practice of PBL (two topics); (c) knowledge and skills (seven topics); (d) competent, caring, ethical, and well-adjusted physicians (six topics); (e) psychosocial and population knowledge (five topics); (f) congruence and consistency of curricular methods (nine topics); (g) affective environment (seven topics); (h) student assessment (three topics); and (i) teaching environment (one topic).

Prioritizing the Topics

The second task in the study was to prioritize the topics according to their importance to the evaluation. A questionnaire, in which the 43 topics were presented in random order, was developed, pilot-tested, and distributed to the three groups of stakeholders: (a) clinical faculty who were familiar with the PBL curriculum (N=153); (b) basic science faculty who were familiar with the PBL curriculum (N=41); and (c) students participating in the PBL curriculum (N=125). The questionnaire used the *magnitude-scaling method* (Lodge, 1987; Witkin, 1984). If certain assumptions are met, magnitude-scale scores are on a ratio scale and can be interpreted as ratios of one to another. Respondents were asked to indicate the importance of the program topics by assigning each topic a value relative to a *reference topic*, which had a preassigned value of 100. Because all the topics represented issues important to some program participants, the scaling procedure required that they make decisions about the *relative importance* of each topic. Response rates were 42.5% (n=65) for the clinical faculty, 70.7% (n=29) for the basic science faculty, and 59.2% (n=74) for the students.[2]

The raw data were analyzed as follows (Lodge, 1987): (a) the data were transformed to logs with base 10; (b) the arithmetic mean of the logs was calculated for each of the 43 topics; and (c) the geometric mean of each arithmetic mean was calculated (that is, the arithmetic mean was raised to the 10th power). For the purposes of this paper, the questionnaire data were scaled separately for clinical faculty, basic science faculty, and students. Each of the three sets of scale scores was then linearly transformed to a common scale. For each program topic, the transformed score was calculated as:

$$topicscore_i = \left(\frac{score_{ij}}{maxscore_j}\right)100,$$

where $score_{ij}$=the magnitude scale score on topic i for group j and $maxscore_j$=the highest of the magnitude scale scores for the group. This

[2]These response rates differ from a companion paper (Brandon, Lindberg, & Wang, 1992) because the results reported here include data from late respondents.

transformation resulted in three sets of scores scaled from 0 to 100[3], as shown in Appendix A.

Results of the Identification and Prioritization of Program Topics

In Table 1, the topics in the top half of the scale (51-100) are shown for each respondent group. Table 1 is summarized as follows.

Insert Table 1 about here

Category 1: Tenets of PBL (Three Topics)

The topic, *self-directed, life-long learning*, was the highest scaled topic for all three groups (see Appendix A). The topic, *thinking and reasoning skills*, also was in the top half of the scale for all three groups, while the topic, *student-centered learning*, was in the top half for basic science faculty and students, but not for clinical faculty.

Category 2: Understanding and Practice of PBL (Two Topics)

Students scaled the topic, *student and faculty (a) understanding of PBL objectives and (b) participation in PBL*, in the top half of all topics.

Category 3: Knowledge and Skills (Seven Topics).

For Category 3, the clinical faculty scaled only one topic, *clinical knowledge and skills*, in the top half of the scale. The basic science faculty and students each scaled four topics in the top half. For both groups, these topics included *basic science knowledge, teamwork and communication skills,* and *clinical knowledge & skills*; for the basic science faculty, the fourth topic was *continuation of basic science through the clinical years,* and for the students, the fourth topic was *integrating information from different disciplines.*

Category 4: Competent, Caring, Ethical, and Well-Adjusted Physicians (Six Topics)

All three groups of respondents scaled the topic, *competent and caring practitioners,* in the top half of the scale.

Category 5: Psychosocial and Population Knowledge (Five Topics)

For this category, clinical and basic science faculty included the topic, *philosophical and community-oriented perspective*, in the top half of the scale; students included none.

Category 6: Congruence and Consistency of Curricular Methods (Nine Topics)

All three groups scaled the topic, *curriculum coverage*, in the top half of the

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[3]The scores of 100 show the highest group scores, and the scores of 0 indicate the zero points on the original magnitude scales.

scale. In addition, the students scaled the topic, *mode of learning*, in the top half of their results.

Category 7: Affective Environment (Seven Topics)

Neither faculty group included any topics from this category in the top half of their results. The students included four: *communication*; *noncompetitive, positive environment*; *commitment and respect*; and *advisor support for students*.

Category 8: Student Assessment (Three Topics).

For this category, neither faculty group scaled any topics in the top half of their results. The students, however, included two topics in the top half of the scale: *tracking student performance* and *review of the effects of external influences*.

Category 9: Teaching Environment (One Topic).

None of the three groups placed the topic in this category in the top half of the scales.

Implications of the Findings for Curriculum Evaluation

Stakeholder-based evaluations have been recommended for involving "people holding different positions in the social structure of programs" (Weiss, 1983, p. 8). Stakeholders have knowledge and experience that enable them to specify program topics that can enhance the understanding of a program (Mark & Shotland, 1985). In the study reported here, the stakeholders identified topics suggesting a greater breadth of program evaluation than is currently common among medical schools offering PBL curricula. In addition to topics commonly selected for evaluation of medical-school PBL curricula, such as those included in the category, *Knowledge and Skills*, JABSOM faculty and students identified topics in categories such as *Congruence and Consistency of Curricular Methods* and *Understanding and Practice of PBL*.

The differences in priorities among the JABSOM stakeholder groups suggest the appropriateness of giving students a say in identifying the program topics an evaluation might address.[4] Of the 17 topics in the top half of the students' scale, 7 were not included in the top half of either faculty group's scale. The students' three high-scaled topics in the category, *Affective Environment*, probably would not have been included if the faculty alone had been responsible for identifying the topics. Partly due to its identification in this study, one of these three topics (*communication*) is currently the focus of considerable program effort. Examples such as these show how the involvement of the stakeholder groups enhances the validity of the program topics.

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[4]Stakeholder involvement in topic selection that results in differences among stakeholder groups' topic priorities, such as in the study reported here, requires evaluators to take additional steps to reconcile differences between groups. The steps we took are presented in Brandon, Lindberg, and Wang (1992).

Some of the topics in the top half of the scale for one or more of the three stakeholder groups (see Appendix A) suggest evaluation designs and methods other than the typical medical-school PBL studies concentrating solely on student outcomes. Topic 6A, *curriculum coverage*, for example, which was scaled high for all three groups, clearly requires an examination of curriculum operations. Similarly, two of the topics in the category, *Affective Environment*, show high scores for the students *(communication* and *noncompetitive, positive environment*), indicating a need to examine curriculum implementation. Other topics such as *self-directed, life-long learning* and *thinking & reasoning skills* (scored very high by all three groups) suggest evaluations of both program implementation and outcomes.

Implication of the Findings for Curriculum Development

The findings presented here reflect JABSOM participants' understanding of the curriculum, the extent to which their values and expectations are consistent with the goals of the curriculum, and the influence of the unique circumstance and culture of each group on the values and expectations of its members. Stakeholder knowledge and values are to some extent interdependent; together, they determine much of what actually happens in the educational setting. The challenge that confronts curriculum developers, then, is to ensure that all groups, each with its different knowledge base and values, understands, accepts, and implements the new curriculum.

To help meet this challenge, we have examined some of the findings we thought most salient for curriculum development. These findings are based on the importance ascribed by the three groups to topics within the categories, *Tenets of PBL, Knowledge and Skills, Psychosocial and Population Knowledge, Congruence and Consistency of Curriculum Methods,* and *Affective Environment.*

Tenets of PBL

The category, *Tenets of PBL*, is clearly the most important for all three groups. The high value attributed to *self-directed, life-long learning*, and *thinking and reasoning skills* indicates success in communicating to participants how students are to learn in the PBL curriculum. The low score assigned by the clinical faculty to *student-centered learning*, however, suggests that clinical faculty as a group did not value this goal. These findings reflect the discrepancy in training received by the students and basic science faculty, who have spent a great deal of time in close proximity to the core group of curriculum developers at the medical school, and clinical faculty, many of whom have private practices in the community and have spent little time at the school. In the first two years of the program, tutor training workshops, required of faculty who chose to participate as tutors in the PBL educational process, were attended largely by basic science faculty. Clinical faculty who elected to serve as clinical skill preceptors, however, often did not attend the orientations and follow-up meetings scheduled to prepare them to take part in PBL.

The findings reinforce the need for systematic communication of curriculum philosophy, goals, and process to all faculty. The curriculum has, in fact, responded to this need. For example, clinical chairs have encouraged more of their faculty to attend tutor training workshops and program planners have more carefully monitored participation in preceptors' meetings. Clinical faculty have responded positively; an upcoming tutor training workshop, specifically for faculty from clinical departments, has been oversubscribed by both compensated and volunteer clinical teachers.

Knowledge and Skills

It is in this category of topics that the influence of cultural differences on group values is most apparent. Students placed a high value on acquisition of both *clinical knowledge and skills* and *basic science knowledge*, as well as on *integrating information from different disciplines.* Both faculty groups, however, valued acquisition of their respective knowledge more highly than they valued acquisition of knowledge of the other group. Neither faculty group scored *integrating knowledge from different disciplines* as highly as students.

This result is informative but not surprising, for such divergence is likely to be found among groups within any profession. Perhaps integration of knowledge will be more highly valued as the curriculum, which has de-emphasized the traditional distinction between preclinical and clinical years and encouraged integration of basic science and clinical learning experiences, becomes more fully implemented. Basic science learning experiences are currently being built into the third and fourth years of the curriculum, just as clinical experiences have been built into the first and second years. Students will study both biological and clinical sciences over all four years.

Psychosocial and Population Knowledge

Just one topic in this category addresses psychosocial issues. Although both faculty groups gave *psychosocial aspects of medicine* higher scores than the students, no group placed this topic in the top half of the scale. The remaining four topics address the population perspective of health and illness and community medicine—two closely related issues. The importance assigned to the four topics varies widely among them. The most probable explanation for this variation is that the participants responded to different aspects of the four statements. In general, faculty attributed greater importance to all four topics than did students. Thus, one reasonable conclusion about the results for this category is that JABSOM faculty value both psychosocial and population perspectives of medicine more highly than do the students.

JABSOM's curriculum goals emphasize acquisition of psychosocial and population knowledge as well as a community orientation toward medicine. JABSOM students, focused on mastering basic science and clinical knowledge, do not yet consider population and psychosocial aspects of health care a high priority. The learning goals of students might be brought into closer alignment with the curriculum's goals if (a) greater emphasis were placed on these knowledge perspectives in student orientations and faculty training and (b) the

prominence of these perspectives in learning materials and evaluation of student performance were increased.

Congruence and Consistency of Curriculum Methods

All groups considered *curriculum coverage* an important program topic. Students also included *mode of learning* among the topics they thought most important.

The curriculum has addressed the problem of rapid growth and change in medical knowledge by encouraging commitment to life-long learning and discouraging the belief that students can learn everything they need to know to become competent physicians in their four years of medical school. Nevertheless, both faculty and students are concerned about the comprehensiveness and balance of the material covered by the curriculum and the match between this material and curriculum objectives.

Part of the concern can be traced to the abundance of medical knowledge available to students and to their uncertainty about how much of this knowledge they need to acquire. Unlike their counterparts in traditional, teacher-centered curricula, PBL students decide for themselves what and how much they must learn. Accustomed to having information presented in measured doses by their college professors, students may find this a formidable responsibility. Faculty, accustomed to deciding how much information from their particular disciplines should be transmitted to students, may also feel uncertain about the depth and breadth of coverage of information in the interdisciplinary PBL setting.

Another part of the concern about curriculum coverage arises from actual gaps and overlaps in the material covered in tutorials, preceptorships, and other learning contexts, as well as the match between the level of students' understanding and the level at which information is presented to them in colloquia and conferences.

It is likely that students' concern with *mode of learning* is in part related to these curriculum coverage issues and to the anxiety engendered by the newly acquired responsibilities that attend student-centered learning. Most students have not encountered these responsibilities in an educational setting before entering the PBL curriculum.

Concerns about curriculum coverage can be addressed in several ways. One approach would be to (a) identify the basic science and clinical information that must be learned and (b) develop an order of presentation of this information that best promotes integration of new and prior knowledge. A somewhat less laborious approach would be to systematically examine, or track, the curriculum. Curriculum tracking would uncover the areas in which information is omitted or repeated, as well as the areas in which one discipline is overemphasized at the expense of another. The school is currently taking the initial steps to develop a tracking system.

Concerns about curriculum coverage might also be lessened by additional training of both faculty and students. Curriculum participants, new to this

learning format, can increase their skills and confidence through discussion, practice, and evaluation.

Affective Environment

The striking difference between faculty and students in values assigned to topics in this category clearly reflects the difference in their respective circumstances within the medical school. Clinical faculty judged *attitudes toward the school* to be somewhat important, but neither faculty group considered significant any other topic addressing the affective environment. Students, on the other hand, attached great importance to four topics addressing interpersonal relations: *communication*; *noncompetitive, positive environment*; *commitment and respect*; and *advisor support for students*. All but *advisor support for students* were among the students' 10 highest scaled topics.

These findings clearly indicate that for students interpersonal relations are a critical part of the medical school experience. JABSOM curriculum planners have responded to a number of student concerns about interpersonal relations, including communication between faculty and students. A student representative from each class now participates in weekly meetings of the school's committee charged with making programmatic decisions. Students are represented on a number of subcommittees addressing focused curriculum development and implementation issues. As committee members, they both receive and give information in a timely fashion. Thus, a constructive mechanism for the mutual exchange of information between curriculum developers and students has been established. This mechanism will allow students to discuss with curriculum developers all concerns related to the affective environment and learning experiences.

Conclusions

The findings of the study reported here provide information about stakeholders' knowledge, values, and expectations about a medical-school PBL curriculum at the end of its second year of implementation.[5] Much of this information is not new to JABSOM curriculum developers and may be familiar to developers of other established PBL curricula. To our knowledge, however, never before has information on PBL program topics been collected, summarized, and presented in such a systematic fashion. It also is the first time it has been prioritized, thereby informing evaluators and planners of the relative value attached to a variety of curriculum issues by the three stakeholder groups.

The findings reported here have implications for evaluators of PBL programs. First, the identified program topics suggest a greater breadth of program evaluation than is commonly found at medical schools offering PBL curricula. Some of the high-priority topics discussed here could not be

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[5]The curriculum has continued to evolve since this study was conducted. Therefore, some of information reported here may currently be somewhat less applicable.

covered in an evaluation that examines only student outcomes. Evaluators of PBL programs might consider focusing on a wide variety of topics or consider using a variety of approaches, including not only the study of program outcomes but also of program implementation and the relationship between implementation and outcomes. Second, the differences in priorities among JABSOM stakeholder groups suggest the appropriateness of including students as stakeholders. Such differences provide additional support to the notion that program beneficiaries should help identify the topics that program evaluations might address.

Our findings suggest at least three implications for PBL-curriculum developers in the early stages of their curricula. First, administrators might consider how to address the difficulties of involving part-time clinical faculty in a radically new program such as PBL. For example, JABSOM clinical faculty assigned a low value to *student-centered learning*, a key tenet of PBL, suggesting that it may have been less difficult to reach basic science faculty than clinical faculty in the early stages of the program. At JABSOM, administrators have taken steps to increase the enrollment of clinical faculty in tutor training workshops and have more carefully monitored participation in clinical preceptors' meetings.

Second, differences in priorities that stakeholder groups give to program topics show variations in the academic culture and in group values that affect the progress and operation of a new curriculum such as PBL. Among JABSOM faculty, for example, both the clinical and basic science groups assigned high priorities to their respective fields of knowledge and gave lower priority to the fields of their faculty colleagues. Neither faculty group valued the topic, *integrating knowledge from different disciplines*, as highly as the students. Students, on the other hand, gave high priority to the curriculum's *mode of learning*, showing concern over the responsibilities of student-centered learning, while faculty scored this topic low. Similarly, the students thought that interpersonal relations are a critical part of the medical school experience; they scaled topics about the affective environment higher than the faculty. Such differences may be common in many educational programs, particularly in their early phases. However, as we are finding, such differences should lessen as programs develop and mature. At JABSOM, we expect that the faculty will continue to increase the integration of basic science and clinical learning experiences. For students, newly-established student-faculty communication mechanisms and student participation on JABSOM curricular planning committees have provided them a larger role in planning and decision making.

Third, the comprehensiveness and balance of the material covered by a new curriculum, and the match between this material and curriculum objectives, are two potential issues for planners of new PBL programs. In an innovative curriculum, students will have new, unfamiliar responsibilities for deciding what and how much to learn, and faculty may lack confidence about

the depth and breadth of coverage of information in interdisciplinary PBL settings. Both groups may be concerned about gaps and overlaps in the material covered in tutorials, preceptorships, and other learning contexts. As JABSOM is doing, PBL planners might consider developing curriculum tracking systems for identifying the information which is omitted, repeated, or overemphasized. Additional training of both faculty and students might also help address both groups' concerns.

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Table 1. Topics in the Top Half (51-100) of the Scale for Each Group

Category of topic	Topic*		
	Clinical faculty	Basic science faculty	Students
1. Tenets of PBL (3 topics total)	1A: self-directed, life-long learning; 1B: thinking & reasoning skills.	1A: self-directed, life-long learning; 1B: thinking & reasoning skills; 1C: student-centered learning.	1A: self-directed, life-long learning; 1B: thinking & reasoning skills; 1C: student-centered learning.
2. Understanding and Practice of PBL (2 topics total)	None	None	2A: student & faculty (a) understanding of PBL objectives and (b) participation in PBL.
3. Knowledge & Skills (7 topics total)	3A: clinical knowledge & skills.	3C: basic science knowledge; 3F: continuation of basic science through the clinical years; 3B: teamwork & communication; 3A: clinical knowledge & skills.	3A: clinical knowledge & skills; 3C: basic science knowledge; 3D: integrating information from different disciplines; 3B: teamwork & communication skills.
4. Competent, Caring, Ethical, and Well-Adjusted Physicians (6 topics total)	4A: competent & caring practitioners.	4A: competent & caring practitioners.	4A: competent & caring practitioners.
5. Psychosocial and Population Knowledge (5 topics total)	5A: philosophical & community-oriented perspective.	5A: philosophical & community-oriented perspective.	None
6. Congruence and Consistency of Curricular Methods (9 topics total)	6A: curriculum coverage.	6A: curriculum coverage.	6A: curriculum coverage; 6D: mode of learning.
7. Affective Environment (7 topics total)	None	None	7C: communication; 7E: noncompetitive, positive environment; 7B: commitment & respect; 7D: advisor support for students.
8. Student Assessment (3 topics total)	None	None	8A: tracking student performance; 8C: review of effects of external influences.
9. Teaching Environment (1 topic)	None	None	None

*The topic numbers shown in these columns are from Appendix A.

APPENDIX A
SURVEY RESULTS ON THE IMPORTANCE OF PROGRAM TOPICS, BY GROUP AND CATEGORY OF TOPIC

Program topic	Clinical faculty	Basic science faculty	Students
Category 1: Tenets of PBL			
1A. Self-directed, life-long learning (preparation of students to become independent, self-directed, life-long learners.)	100.00	100.00	100.00
1B. Thinking & reasoning skills (development of thinking and reasoning skills such as the generation of hypotheses and the identification and critical appraisal of necessary information, and problem-solving).	95.79	98.47	81.23
1C. Student-centered learning (fosters student-centered, rather than teacher-centered, learning.)	26.13	65.13	53.95
Category 2: Understanding and Practice of PBL			
2A. Student & faculty (a) understanding of PBL objectives and (b) participation in PBL (student, faculty, and staff understanding of PBL objectives and their respective roles in the program; encouragement of participation in the PBL process)	35.37	44.07	65.73
2B. Applicants' understanding of PBL (Medical School applicants' understanding of the PBL philosophy and process before they are accepted into the program)	8.71	21.98	42.07
Category 3: Knowledge and Skills			
3A. Clinical knowledge and skills (acquisition of adequate clinical knowledge and skill in applying this knowledge to patient care)	69.48	51.70	70.41
3B. Teamwork & communications skills (development of teamwork and of skill in communicating with other health care workers and with patients)	45.25	52.90	54.40
3C. Basic science knowledge (acquisition of adequate basic science knowledge)	38.29	78.43	62.37
3D. Integrating information from different disciplines (integration and synthesis of information from different disciplines and knowledge perspectives)	35.25	43.01	54.66
3E. Learning resources (provision of adequate and varied learning resources and facilitation of their use)	29.93	34.90	28.91
3F. Continuation of basic science through the clinical years (continuation of the basic sciences into the 3rd and 4th year of medical school)	25.69	53.07	16.66
3G. Preparation for the NBME (preparation of students to pass the NBME examinations)	19.50	23.93	46.87

(APPENDIX A, continued)

Program topic	Clinical faculty	Basic science faculty	Students
Category 4: Competent, Caring, Ethical, and Well-Adjusted Physicians			
4A. Competent & caring practitioners (development of competent, caring, and ethical practitioners who demonstrate humility in their relationships with other health care workers, patients, and their families)	93.83	63.05	91.53
4B. Satisfied physicians (production of physicians who are satisfied with their career choices; fostering of enthusiasm for the profession of medicine)	47.12	32.55	47.68
4C. Student learning about self (promotion of student learning about their habits, attitudes, and values; development of the habits, attitudes, and values that are expected of physicians)	45.63	43.59	30.58
4D. Student emotional well-being (fostering of emotional health and development of self-esteem in students)	40.87	45.13	36.67
4E. Social awareness & civic involvement (development of social awareness and involvement in civic activities)	19.88	16.50	18.35
4F. Physicians' emotional health (effect of educational experiences on physicians' emotional health and effect of emotional health on qualit y of patient care)	19.85	12.95	22.08
Category 5: Psychosocial and Population Knowledge			
5A. Philosophical & community-oriented perspective (acquisition of a broad, philosophical—not just technical and clinical—perspective of medicine and decision-making that is in the best interest of the community as well as the individual patient)	58.43	56.27	44.89
5B. Psychosocial aspects of medicine (development of an understanding of the psychosocial aspects of health and illness)	46.45	41.14	32.13
5C. Understanding community medicine & promoting wellness (development of an understanding of the role of community medicine and the value of promoting wellness and preventing illness)	37.83	41.07	35.29
5D. Population perspective (acquisition of a population perspective of health and illness)	23.97	24.16	21.49
5E. Community-oriented, primary care (development of an interest in community-oriented, primary care practice)	22.39	28.94	17.05

(APPENDIX A, continued)

Program topic	Clinical faculty	Basic science faculty	Students
Category 6: Congruence and Consistency of Curricular Methods			
6A. Curriculum coverage (provision of health care problems that reflect program objectives and of comprehensive and balanced coverage of basic and clinical sciences)	56.65	63.12	73.29
6B. Specification of clinical skills to be covered and consistency among preceptors (specification of sets of clinical skills to be covered in the units; consistency among preceptors in the kinds of learning activities they provide students and in their expectations of students)	31.13	30.44	43.99
6C. Match between learning activities & objectives (match between the student learning activities and the PBL goals and objectives)	30.61	40.49	31.42
6D. Mode of learning (provision of multiple modes of learning, including lecture; student participation in selection of learning mode)	29.29	32.72	66.37
6E. Continuity of learning activities (continuity of learning activities from unit to unit)	27.21	39.23	33.63
6F. Coordination of learning activities (coordination of learning activities between tutors and clinical skills preceptors)	23.33	20.86	30.52
6G. Opportunities for research & for providing community education (provision of opportunities for students to take part in research and to provide community education)	20.64	20.55	17.56
6H. Consistency among tutors (consistency among tutors in the application of the tutorial process)	15.58	13.39	26.40
6I. Interest in academic medicine & research (development of an interest in academic medicine and medical research)	12.19	15.06	8.05
Category 7: Affective Environment			
7A. Attitudes toward the school (fostering of enthusiastic, joyful learning and positive attitudes toward the program and school)	49.69	21.30	35.86
7B. Commitment and respect (encouragement for faculty commitment to students as well as to the program; development of mutual respect between students and their teachers)	34.99	28.97	69.68
7C. Communication (encouragement for communication among program planners, faculty, and students and for constructiveness of responses to input from each other)	33.12	34.97	89.53
7D. Advisor support for students (preparation and encouragement of advisors to support their students and keep them informed of matters relevant to their educational interests)	26.13	17.11	53.47

(APPENDIX A, continued)

Program topic	Clinical faculty	Basic science faculty	Students
7E. Noncompetitive, positive environment (a noncompetitive and non-threatening learning environment; positive interaction and resolution of conflict among program participants)	26.02	27.71	81.85
7F. Student involvement in decision-making (involvement of students in programmatic decision-making)	19.50	12.54	43.22
7G. Examination of student stress (acknowledgement of the stress experienced by first and second year students and examination of its sources)	16.11	26.79	34.56
Category 8: Student Assessment			
8A. Tracking student performance (tracking of student performance across all units; provision of feedback to students about their performance)	39.23	40.56	56.80
8B. Review of student assessment instruments (review of assessment instruments to see if they are measuring student performance on curriculum goals and objectives)	37.65	44.44	47.18
8C. Review of the effects of external influences (review of the effect of external influences, such as the NBME examinations, on the curriculum and on student learning)	15.05	15.41	52.82
Category 9: Teaching Environment			
9A. Faculty workload & morale (maintenance of manageable faculty w orkloads; recognition and reward for faculty participation in the PBL curriculum; maintenance of faculty morale)	25.31	47.55	32.38